

**FIRST CONFERENCE ON THE USE OF  
PROBABILISTIC RISK ASSESSMENT FOR HIGH-ENERGY LASER SAFETY  
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**ABSTRACT**

**Use of Quantitative Risk Assessments to Support  
Management Decision-Making and Resource Allocation**

Dr. David H. Johnson  
Senior Vice President and Chief Scientist  
PLG Risk and Performance Engineering  
EQE International, Inc.  
300 Commerce Avenue; Suite 200  
Irvine, CA 92602  
Telephone: (714) 734-4242  
Fax: (714) 734-4282  
Direct phone: (714) 734-2507  
e-mail: heywood@plg.com

This paper draws on the author's 20 plus years experience in the development and application of Probabilistic Risk Assessment methods in a variety of industrial and government applications. These applications have been performed to provide a systematic characterization of the risk for specific facilities and to support risk management. At the core of these applications is the quantitative definition of risk advanced by Kaplan and Garrick<sup>1</sup>. Specific applications include commercial nuclear power, DOE research facilities, transportation, nuclear weapon systems, agricultural decisions, chemical facilities, and aerospace and pipeline systems. The same methodological framework has been used to address programmatic risks as well as facility performance.

A brief description of the Kaplan-Garrick framework is provided along with example descriptions of selected applications. This experience provides the foundation to make several general observations. These include: the value of PRA in supporting risk-informed decisions to the importance of facility-specific applications, requirements for analytical tools, the importance of clear and complete documentation, and the desired makeup of analysis teams.

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<sup>1</sup> S. Kaplan and B. J. Garrick, "On the Quantitative Definition of Risk," *Risk Analysis*, Vol. 1, pp. 11-27, 1981.